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UTILIZATION OF DIAGNOSTIC TRANSTEMPORAL GUIDED HIGH MECHANICAL INDEX ULTRASOUND AND A SYSTEMIC MICROBUBBLE INFUSION TO TREAT ISCHEMIC STROKE WITHOUT FIBRINOLYTIC AGENTS

ACC Oral Contributions
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Session Title: Echocardiography: Current and Future Applications
Abstract Category: 34. Contrast Echocardiography
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Background: Intermittent high mechanical index (MI) ultrasound impulses, guided by low MI imaging during a microbubble (MB) infusion, may be effective in recanalizing acute vascular thromboses, without the need for fibrinolytic therapy. The potential for this strategy to treat ischemic stroke (IS) has not been evaluated.

Methods: IS was created in eight pigs by thrombotic occlusion of the ipsilateral internal carotid artery. Pigs were randomized to aspirin and high MI transtemporal ultrasound (TTU) alone, or aspirin and high MI TTU with an intravenous MB infusion of 3% Definity (Lantheus). In the 2nd group, high MI impulses from a diagnostic transducer (Philips S5-1) were delivered only when low MI imaging detected microbubbles within the large and small vessels of the ipsilateral cerebrum. Treatments were applied for 30 minutes. Ascending pharyngeal angiography was performed to examine for recanalization at 30 minutes into treatment. Evan's Blue was used to examine for altered blood brain barrier (BBB) permeability.

Results: The 30 minute angiographic recanalization was 80% (4/5) in the TTU/MB treated group versus 0% (0/3) in the TTU alone group. The Figure demonstrates recanalization in a TTU/MB treated pig, with TTU alone for comparison. TTU/MB treatment did not alter BBB permeability or induce intracranial hemorrhage.

Conclusions: Diagnostic TTU and intravenous MBs, combined with aspirin, may be an effective alternative method of treating IS, without the need for fibrinolytic agents.